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FEBRUARY, 1913.

ENTOMOLOGICAL NEWS

Vol. XXIV. No. 2.

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PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting August and September,** in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 25 CENTS

Advertising Rates: Per inch, full width of page, single insertion, $1.00; a discount of ten per cent. on insertions of five months or over. No advertisement taken for less than $1.00—Cash in advance.

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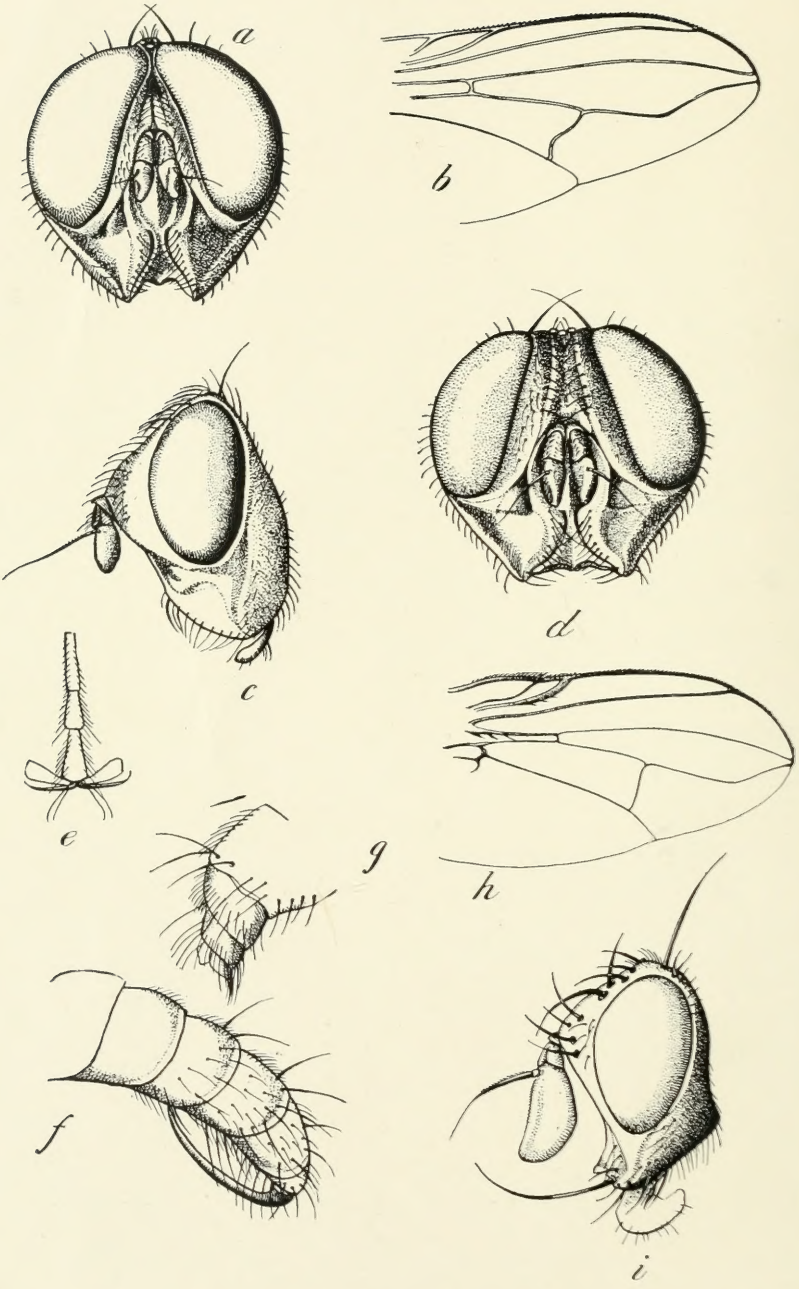

NEW TACHINIDAE—WALTON.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV. FEBRUARY, 1913. NO. 2.

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New North American Tachinidae (Dipt.).

By W. R. WALTON, Bureau of Entomology, Washington, D. C.*

(Plate III)

The first form described below adds a new genus and species to the small aggregation of Muscoids known to be parasitic on beetles of the genus *Lachnosterna*.

The members of this small group, although rather widely separated in the existing artificial classifications, are to some extent similar in habitus, especially as regards the facies.

The front is produced, the antennae and eyes small, the cheeks wide and the vibrissae placed considerably above the front edge of the oral margin. These peculiarities are most marked in the genus *Microphthalmus*. It seems probable that these parasites of *Lachnosterna* are nocturnal or at least crepuscular in habit, as in the genus *Pyrgota* of the Ortalidae which is also parasitic on *Lachnosterna*. In the latter group there is a remarkable similarity in the conformation of the head to the Muscoid parasites of the "may beetles."

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Eutrixoides n. gen.

Face on the lower half of its sides bare. Antennae reaching about half way to oral margin, vibrissae weak, cruciate, far above oral margin. Occiput strongly convex. Frontals do not extend below base of second antennal joint, arista microscopically pubescent. Horizontal diameter of the occiput above the neck less than one-half that of the eye, head at vibrissae noticeably shorter than at base of antennae. Sides of face at narrowest part, one-third to one-half as wide as median depression. Penultimate joint of arista at most only slightly longer than wide. Palpi subcylindrical, less than one-half as wide as proboscis. Fourth vein entire, apical cell open, ending close to extreme wing tip. Sternopleural bristles two, dorsocentrals variable. Inner vertical macrochaetae cruciate, outer verticals merged with the cilia of posterior orbit, all macrochaetae of face and front weakly developed. Abdomen without ventral carina. Ovipositor horny, flattened, exposed, doubled forward under abdomen, nearly one-half as long as abdomen. Male without subanal appendages.

At first glance this form seems to fall naturally to *Eutrixa* Coq., but the remarkable development of the ovipositor necessitates the erection of a new genus for its reception.

Eutrixoides jonesii nov. sp. (Pl. III, figs. **a-f.**)

Length, 7 to 8 mm. Habitat, Anasco, Porto Rico. General appearance to naked eye, slender, brownish gray, nowhere shining. Legs rather long, wings slightly brownish.

Microscopic description: Male, front and ocellar triangle light brown, vitta almost linear immediately before the ocelli. Parafacials cinereous, a narrow cinereous line extending therefrom upward along inner margin of eyes to vertex. Antennae entirely clear ferruginous yellow, arista slender, incrassated only at extreme base, microscopically haired. Cheeks yellowish with whitish reflections. Palpi and proboscis yellow.

Thorax yellowish gray, pollinose, opaque. A distinct oval black spot surrounds each of the last two anterior dorsocentral bristles, inner longitudinal vittae distinct, black, extending back beyond suture, space included between them darker than surrounding surface. Outer longitudinal vittae distinct, expanding into smoky elongate spots extending from humeri nearly but not quite to postalar callus. Scutellum yellowish gray pollinose, sides brown.

Abdomen opaque brown, first segment as long as, or longer than, second, with a narrow pale line along posterior borders of all segments. Slightly yellowish gray pollinose on dorsolateral bases of all segments when viewed from rear. Macrochaetae weak, no median discal or marginal macrochaetae on 1st or 2nd segments, usually a weak apical pair on 3rd segment, 4th segment with discal but no marginals.

Wings tinged with brown, long, somewhat pointed, apical cell open in margin and entering costa close to extreme wing tip. Squamae concolorous with wings.

Coxae yellowish, femora brown, knees yellow; tibiae and tarsi yellowish, densely clothed with short black hairs. Claws of front feet as long as last tarsal joint.

This sex is easily distinguishable from the male of *Eutrixa* by its much narrower front and face.

Female: Front at narrowest part about one-half eye width. Ovipositor exposed, horny, slightly curved, clear brownish and doubled forward beneath abdomen. Otherwise this sex closely resembles the male.

Type.—A female deposited in U. S. National Museum, Washington, D. C. Four specimens, two of each sex, reared from adult beetles of the genus *Lachnosterna* (sp?) collected at Anasco, Porto Rico, May 14-16, by Mr. T. H. Jones, in honor of whom the species is named.

Chaetophleps crassinervis n. sp. (Pl. III, figs. **h, i.**)

Minute, opaque grayish, wings hyaline. Facies resembling *Plectops melissipodes* Coq. Front opaque cinereous, slightly wider than either eye, sides parallel, parafacials almost linear, facial depression as wide as either eye, face entirely cinereous. Vertical bristles stout, almost as long as eye-height, curving backward. Fronto-orbitals three, the lowest stronger, upper two close together. Frontals in a single row descending below the base of second antennal joint. Several proclinate coarse black hairs between frontals and margin of eye opposite base of antennae. Lower half of face bare. Antennae entirely black, minutely pubescent, descending to or slightly below oral margin, second joint short, third joint largely developed, straight on front edge, posterior edge convex, at widest part fully one-half as wide as either eye. Penultimate joint of arista scarcely longer than broad, arista pubescent on its basal half and incrassated nearly to the middle. Vibrissae inserted on the oral margin, stout, very long and cruciate, three or four bristly hairs above them on vibrissal ridges, remainder of ridges bare. Lower part of occiput produced backward somewhat as in *Thryptocera*. Proboscis short, yellow, palpi slender, black.

Thoracic dorsum ash-gray, opaque, inner vittae brownish fading out abruptly at suture. Outer vittae expanded into blackish triangles and ceasing immediately before suture. A circular blackish stain surrounds bases of all dorsocentral macrochaetae. Posterior dorsocentrals two or three, some large bristly hairs scattered among ordinary vestiture of dorsum. Scutellum with three pairs of marginals, apical pair absent. Hairs of disc gradually increasing in strength toward apex where the outermost may be termed macrochaetae.

Abdomen ovate, bearing only marginals on all segments, broadly cinereous on bases of segments two, three and four, remainder of abdomen black, almost shining.

Legs stout, black, middle tibiae with a stout bristle on front side near the middle. Sternopleural macrochaetae four, the upper pair very stout, the lower quite weak.

Wings broad, hyaline, first vein incrassated on its apical third where it bears three or four bristles, third vein bristly nearly half way to small cross vein, apical cell open, ending in extreme tip of wing.

Type.—A female collected by the author at Hyattsville, Maryland, deposited in U. S. National Museum, Washington, D. C.

The species above described is referred to *Chaetophleps* merely because it runs out there in Mr. Coquillett's key to the genera. It cannot be placed in either *Plectops* or *Thryptocera* because the penultimate joint of the arista is not elongated, although its habitus indicates conclusively a close affinity with these forms.

It seems probable that a separate genus will eventually have to be erected for this species; in the meantime it would be folly to do so upon the unique type.

EXPLANATION OF PLATE III.

Eutrixoides jonesii, n. sp.
a, front view of head, male.
b, wing.
c, side view of head, female.
d, front view of head, female.
e, front tarsus of male.
f, lateral view of abdomen, female.
g, *Eutrixa exilis* Coq., tip of abdomen, female.
h, *Chaetophleps crassinervis* n. sp. wing.
i, *Chaetophleps crassinervis,* head.

Fragments on North American Insects—III.

By A. A. Girault, Nelson (Cairns), North Queensland.

1. **On Herbaceous Swell-galls.**

Some time in 1902 I noted the fact that the swellings or galls occurring on the stems of various plants always contain stationary larvae; that is, the larvae remain in one particular spot, which would indicate constant irritation as a possible cause. It is a noteworthy fact that stem-boring larvae seldom cause these formations.

2. **The Dung Beetle, Canthon laevis (Col.)**

Two round, compact balls of cow dung, resembling a medium sized marble, were found June 28, 1902, at Blacksburg, Virginia, under a fence rail lying over moist soil; they were buried to the level of the earth. Each measured five-eighths of an inch diameter. One contained an egg, but the other was simply nothing but dung. The egg was not central and is remarkably large, yellowish in color and with a varnished appearance like the integument of elaterid larvae, yet soft and easily crushed. It is almost gourd-shaped. Two other balls obtained on June 30 were opened on July 3; one was empty, the other contained a large grub in a perfectly smooth cell. The ball was patched and buried into moist soil; the larva subsequently pupated on July 21; ten days later the pupa commenced to turn brownish and the adult appeared on August 3. The beetles were still laying eggs on July 10.

This short, compact, black-brown scarabaeid is the common dung-rolling species of southwest Virginia, but I am not sure that I have identified it correctly.

3. **Sanninoidea exitiosa (Say) (Lepid.).**

A female of this species was observed depositing eggs on the trunk of a peach tree on September 15, 1902, about 11.30 a. m., at Annapolis, Maryland. About six eggs were deposited within four mnutes.

4. **Notes on the Occurrence of Euchaetias egle Drury (Lepid.).**

A larva of this species was taken from milkweed at Blacksburg, Virginia, July 14, 1902. It was fed and four days later, presumably, entered the soil of the rearing-cage. The cocoon

was found on July 22 upon the surface of the soil, where it was very difficult to see. It was composed almost entirely of the hairs from the caterpillar's body, the black ones predominating. Its exterior was covered with particles of dust and twigs. The moth emerged early in the morning of August 7. On August 27, 1902, in the same locality it was noted that the caterpillars of this moth were very numerous and in different stages of development. The milkweed plant was being frequently stripped of its foliage by them. They are gregarious, resting in clusters. A colony of the larvae obtained during the first few days of September pupated on the fourth of that month in a mass on the paper forming the bottom of a bell-jar under which they had been confined. The cocoons were clinging together and, when handled, hundreds of the hairs of which they were constructed entered the hands like so many prickles from a cactus; they cause the tender portions to itch. The cocoon adheres closely to the pupa, which shows no sign of life when handled.

5. **Miscellaneous Notes on Malacosoma americana (Fabricius). (Lepid.).***

The cocoons of this species are composed: (1) of an outer layer of loose folds of silk, (2) a middle layer, compact, and (3) an inner layer still more compact, the silk finer. They are covered with a golden-yellow, or sometimes whitish, powder. The pupae are more or less covered with a fine white powder.

From cocoons collected May 29, 1902, and kept in the laboratory, several moths emerged on June 9 and five others on June 13. On June 10 a few moths were observed in the field. During the night of June 12-13 four egg masses were deposited by the moths in the laboratory and seven had been obtained by June 21, when moths were still emerging. Emergence continued until June 30, or for a period of at least as long as a month. Although the larvae leave the nest and crawl to the ground to construct their cocoons in the grass, under fence rails, logs, boards, stones and so on, still a few use the nest for that purpose as well as the crevices of the bark of the

* See also Note 3, page 401, Vol. XXIII.

tree trunk. Cocoons formed in the nest, however, appeared to be due to disease, as usually they were found to contain unhealthy looking pupae.

6. **A Note on Autographa brassicae Riley (Lepid.).**

A nearly full-grown larva of this species was found at Paris, Texas, July 5, 1904, feeding upon tobacco. Three days later a cocoon was found in a furrow along the upper surface of a leaf. It was merely a triangular enclosure of fine-spun, white, closely-woven silk, through which the larva was plainly visible. The latter pupated at 12.30 P. M., July 8. On July 13 the chrysalis commenced to change to a brownish color at the wings and the moth emerged during the early morning of July 14, after a pupal stage of about five days, eighteen hours. On August 11, 1904, the larvae were still common on tobacco in a garden, quite badly injuring some of the plants. On July 17 it was noted that the adults were about lights at night in considerable numbers.

7. **Euptoieta claudia (Lepid.).**

The very beautiful toy-like chrysalis of this butterfly was obtained at Paris, Texas, October 16, 1904; it became almost black just before emergence, the silver spots in the wings fading considerably. After emergence, I could not force it to take any position other than one, in which the wings could hang down. It was obviously uneasy in any other position.

8. **Celatoria diabroticae Shimer (Dipt.).**

A puparium of this species was found clinging to the leaf of a corn plant (Paris, Texas, May 27, 1904) and another in the same position but near the dead body of *Diabrotica vittata;* the latter had one side of the abdomen missing and the elytra. An adult emerged from one of these on May 31, 1904.

9. **Anisota senatoria Hübner (Lepid.).**

A colony of the caterpillars of this moth were quite often found late in August, 1902, at Blacksburg, Virginia, clinging to the naked twigs and leaf petioles of oak; they had stripped these latter themselves. But they were found on certain kinds of oak only and never on *nigrum;* they even refused the latter when urged by hunger as I found by experiment. Professor E. A. Smythe, of the Virginia Polytechnic Institute, told me

that he had had the same experience with them. The larvae stripped the leaves to the midrib.

A colony obtained on August 26, 1902, and placed within a rearing cage molted on August 28 in clusters, leaving the shed skins in conspicuous masses attached along the twigs. The pupae were formed in the earth several weeks later.

10. **A Few Fragments on Anasa tristis De Geer (Hemip.).**

The following miscellaneous notes were taken at Paris, Texas, in 1904. On June 7, a male of the Tachinid *Trichopoda pennipes* was reared from an adult female *tristis* which had been captured on May 15 and kept in confinement. The puparium of the fly was formed about an inch below the surface of the soil in the rearing jar. The host died on May 23; its abdomen was empty as found by dissection. Mr. C. T. Brues identified the parasitic fly. Its maggot made no visible exit through the body of its host. In seven egg-masses of *tristis* collected in the field from squash plants between May 30 and June 11 there were 27, 13, 12, 20, 18, 29 and 34 eggs respectively; these masses were either on the under or upper surfaces of the leaf, but most of them on the under surface; one mass was on the stem of the plant. A female dissected on June 11 contained in her ovaries 40 eggs, many of which were imperfect and pale; they filled the entire abdominal cavity.

Some eggs deposited by a female early in the morning of June 2 hatched on June 8 about noon, or after a period of about seven and three quarter days; ten eggs deposited at two o'clock of the afternoon of June 20 hatched about noon, June 29, or after eight days, twenty-two hours. A third lot of eggs laid during the night of June 21-22, hatched late p. m., June 30, or after about nine days.

When hatching the nymph of this species rises perpendicularly from the exit hole in the end of the egg; before the apex of the abdomen leaves the latter, the pinkish appendages commence to spread and by the time the abdomen has been extricated, the bug pushes itself from the egg and immediately walks weakly away. The exit-hole is opened merely by pushing aside a shield-shaped lid whose presence is not visible

until a few hours before hatching when it is defined by lines of yellow, punctiform spots. The newly hatched nymphs are red, the abdomen green; the colors of the first stadium are present after about a half-hour.

A female observed depositing eggs on June 20 (in rearing jar) laid one about every minute and a quarter; during the process the tip of the abdomen was rubbed up and down the surface of the leaf for short distances. When the egg was passed the abdomen was lifted, whereupon a knotlike swelling could be seen passing slowly down and out of the oviduct. This was the egg. It was extruded base down and placed on the spot where the abdomen's tip had been rubbing.

In a garden, egg masses of this species were found on the foliage of cotton and watermelon.

11. **Notes on Hadronotus carinatifrons Ashmead (Hymen.).**

Females of this egg parasite were observed in the field at Paris, Texas, June 11, 1904, depositing eggs into a mass of the eggs of *Anasa tristis*. The mass of host eggs contained thirty-four individuals; it was kept and the resulting adults of the parasite emerged during the morning of June 28; the non-parasitized host eggs hatched between June 20 and June 23. The *Hadronotus* continued to emerge until July 3.

Adults kept in confinement with fresh lots of host eggs deposited into them, died usually after from twenty-four to thirty-six hours. The ovipositing female straddles over the host egg when depositing into it, the legs usually resting on adjoining hosts; the body is very still, humped, the head and antennae held down, the latter quiet and held against the face or else hanging inert; the posterior legs are extended backward and fixed to the sides of the attacked egg as if pulling, while the whole body at times pulsates almost imperceptibly back and forward. A single egg is deposited into each host and this usually at one end of it, low down, so that the female's body during oviposition is usually inclined upward. After deposition the female usually crawls off a short distance and then returns to the mass of host eggs to recommence.

The perfect embryo of the parasite fills the whole interior of the host egg, which finally darkens.

12. **The Occurrence of Chalcis ovata Say in Texas (Hymen.)**

The adults of this species were captured on the following dates at Paris, Texas, in 1904, from a wire screen around a back porch of a residence: March 2, 21, 22, 24 and 30. Up to March 24 there were only a few specimens. Next day they were much more numerous, about twenty specimens; on March 30, nearly two hundred specimens were obtained. On May 7 it was noted that the adults had not been seen for many days and in fact they were not noticed again until October 12, when an adult was found on a cotton leaf in the field.

13. **Basilarchia archippus Cramer (Lepid.).**

A nearly full-grown larva of this species was obtained at Blacksburg, Virginia, June 28, 1902, and kept in the laboratory. It was on a willow, upon which it fed by commencing at the outer edge of a leaf and eating in about half-way to the mid-rib, continuing thus until a rectangular piece had been eaten from the margin of the leaf; it then ate out the remaining rectangular leaf portion down to the mid-rib. It feeds jerkily, the head being lowered every time the larva bites.

On the morning of July 2, this larva was found to have constructed a large groundwork of silk, from which it was suspended in preparation for pupation. The chrysalis appeared on the next morning and the adult emerged during the early afternoon of July 8, or after about four and a half days. July 7, 1902, another larva was obtained from willow, full-grown. In the early afternoon of July 8, it was found suspended from a pad of silk preparatory for pupation; the abdomen was curved upward, the thorax humped, the head tucked under. At 3:15 P. M., the same day, an inner squirming motion of the larva was noticed in the form of quick convulsions lasting about twenty minutes, followed immediately by a split of the integument along the thorax; the chrysalis, by alternately lengthening and shortening its body, quickly freed itself from the larval integument.

At this point it accidentally dropped to the ground, a distance of four feet; its skin was broken by the fall. However, though apparently dead the next day, on July 10 and 15 it had seemingly recovered and turned very dark on July 17. At 8 A. M., July 18 the butterfly was trying to emerge, but did not succeed in doing so. The wound delayed the development greatly, it seems, and finally killed the insect. The hibernacula of this species are constructed of a single willow leaf with its faces folded together and tied there by silk. The hibernating larvae leave them by means of a comparatively large gaping hole at the distal end. In the same locality, chrysalids of this species have been seen in May.

14. **A Record of Eupelmus reduvii Howard (Hymen.).**

Seven adults of this parasite, including both sexes, were reared from the eggs of *Arilus cristatus* (Linnaeus) collected at Annapolis, Maryland, December 26, 1903. The parasites emerged at Paris, Texas, April 1-12, 1904. They were identified by William H. Ashmead. The host eggs were on peach.

15. **Dryocampa rubicunda (Lepid.).**

An eggmass of this species was found at Blacksburg, Virginia, August 3, 1902, on the under surface of a leaf of maple. They were in a single layer, the mass round in outline, large, concaved. When ready to hatch the eggs are pale, the perfect embryo distinctly visible; the exit-hole is crescentic and on the side over the embryo's head. After desertion, the eggs are transparent, like small capsules of gelatine. The mass contained about forty eggs. On August 6, larvae were present on maple in all stages. One colony had just hatched, another about half-grown, while some appeared to be nearly full grown. These were all in the same tree. The young larvae have black heads, the old ones red, the most striking difference between them. When first hatched the larva is pale yellow tinged with green; head and legs black; the prolegs pale yellow; two small, black hornlike processes are borne

by the second thoracic segment. All of the eggs do not hatch at the same time.

Larvae hatching on August 3, 1902, and kept in confinement molted the first time on August 8, late in the afternoon. The cervical and anal shields are distinct in the second stadium, but less so as the larva ages. The larvae nearly doubled their size in this stadium. The second molt occurred on August 14 and the third on August 21; after the latter, the head became red in most cases—there were a few exceptions. Smaller and younger larvae have been observed which had red heads, but the majority seem to change only after this molt. No more molts were observed. Pupation occurred on September 3 and that stage passed the winter.

Pupation with other larvae was noticed on August 10 and 13.

16. **An Occurrence of Halisidota tessellata (Lepid.).**

On July 16, 1902, a pupa of this moth was found under a log; it was of the usual form for its family, but the cocoon was very flimsy. The adult emerged on July 21. On July 9, 1902, several adults were taken in the field.

17. **Certain Cynipid Galls Eaten by Children (Hymen.).**

From conversations with some citizens of Floyd County, Virginia, in June, 1903, and from statements voluntarily made to me by other citizens of Virginia, I have been led to think that there is some foundation for believing that children have a fondness for the taste of oak-apple galls (*Cynips* spp.). A graduate student in the Virginia Polytechnic Institute upon seeing a specimen stated voluntarily that he "used to eat them when a child and that when they were smaller and contained a little worm in the centre." A senior student in the same school also made remarks to the same effect and said also that some of them were sweeter than sugar; he had eaten the larger specimens "as big as a woman's fist."

18. **A Note on Ovipositing Females of Colias philodice (Lepid.).**

At Blacksburg, Virginia, June 30, 1903, in a clover field, I watched females of this common butterfly for two hours in the morning—the sun shining brightly—and they seemed to be flitting about in a frivolous manner, alighting here and there and placing an egg by curving the abdomen up to the spot intended for it. Seemingly, they thus continue, hour after hour, moving ceaselessly and apparently at random, but never failing to pause here and there to leave an egg. The latter becomes pinkish after about twenty-four hours.

19. **On Hyphantria cunea Drury (Lepid.).**

There was found on May 10, 1902, at Blacksburg, Virginia, a female of this species laying eggs upon an apple leaf. On the following day, the moth having been confined, oviposition was completed, the female then dying. The eggs are deposited in an irregular circular mass on the under surface of the leaf, in a single compact layer, and covered with a loose network of gray hairs from the abdomen of the parent moth. They are pale green, nearly the color of the surface upon which they are deposited, circular from above. Their surface is simple, but when seen under a microscope with tubercular projections. By June 4, the larvae from these eggs had grown to nearly a half inch and were then colored like the older larvae.

On June 20 it was noticed that in their nests the larvae in the field were only about a third grown. The second generation of larvae was a quarter of an inch long by the first of September, 1902.

20. **Variation in Hibernating Adults of Megilla maculata DeGeer (Coleop.).**

A large mass of this beetle was found hibernating under a large chip of wood near a stump in a ploughed field near Paris, Texas, February 25, 1904. In several individuals a large mesial portion of the elytra was olive green, changing gradually to the usual pink from its edges. Also many speci-

mens were very pale pink, others light reddish pink. One specimen was wholly dull olive green, with the usual black markings, but a well-marked color variety, nevertheless.

21. **The Threatening Attitude of a Staphylinid (Coleop.).**

While camped at Mountain Lake, Virginia, July 26, 1902, a large species of this family was noticed in a sandy road leading down the mountain; the abdomen was curled over its back as usual. It was walking rapidly and concealed itself under a piece of wood when I approached. Upon moving the hand toward it, the abdomen was suddenly darted out as if to sting; upon closer approach of the hand, the movement was more rapidly repeated and a white forked process suddenly projected from the anus at each movement. The insect was harmless.

22. **The Host of Anagrus spiritus Girault (Hymen.).**

Late in March, 1912, I received for identification from Mr. R. L. Webster, Iowa State College of Agriculture and Mechanic Arts, five slides bearing specimens of this species, all labelled "From egg of *Empoasca flavescens*, Ames, Iowa. R. L. W.," and respectively, "Exp. 234. 26 July, 1911," bearing 1 ♂, 1 ♀; "Exp. 208, 12 July, 1911," bearing 1 ♂; "Exp. 235, 27 July, 1911," 1 ♂, 1 ♀; "Exp. 207, 22 July, 1911," bearing 1 ♂, and "Exp. 233, 26 July, 1911," 1 ♂; a total of 5 ♂'s, 2 ♀'s.

I have noticed a mistake in the original description of this species (Entomological News, XXII, May, 1911, pp. 208-209), where it is stated "that the sixth funicle joint is barely longer than the first (p. 208, next to the last and last line); the *second* funicle joint was intended instead of the first; more, the second joint is slightly longer than the first. In the next sentence (running over to the first line of p. 209) we read "whereas in *incarnatus* it is distinctly longer than the first funicle joint by at least a fourth," the *it* referring to the sixth funicle joint, again the first funicle joint should have read the second. The identification of these specimens was not easy and with certainty may have been impossible were it not for the fact that I had specimens of its closest ally, *armatus*

Ashmead, with which to compare it. Thus, in my table of the North American species of *Anagrus* the specimens were easily traced to the section containing *armatus* and *spiritus*, but I could get no closer without scrutiny of the original descriptions. The two species are very closely related, but *spiritus* has more curved and broader fore wings, the latter bearing a line or two more of discal ciliation and with the naked area clearly delimited. These points do not always show in single specimens of either species. Exceeding care must, therefore, be exercised in identifying the closely allied species of these minute *Mymaridae*.

In the Iowa specimens of *spiritus* much of the cephalic portion of the thorax was dusky black, while the abdomen was wholly dark, the pale intersegmental spaces not showing; hence, they resembled the variety *nigriventris* of *armatus*.

Mr. Webster (*in litt.*, February 14, 1912,) wrote concerning the specimens of *spiritus*: "These were reared from the eggs of the Jassids, the same being cut out from the leaf where they had been deposited and isolated in vials." The species is recorded in the literature as a probable parasite of the eggs of *Aphis pomi* De Geer, but this definite record of Mr. Webster makes the recorded host still more doubtful. The fore wings of *armatus* are only compartively like those of *Polynema longipes* (Ashmead); they, in reality, are still much narrower. In another place I show that *spiritus* is a synonym of *armatus*.

The Genus Brachynemurus (Neuroptera).

By Nathan Banks, East Falls Church, Virginia.

The Myrmeleonid genus *Brachynemurus* in our fauna includes many species which are widely separated in structure from the original typical species. Originally, it included, in our fauna, two closely similar forms; but gradually other species have been added until it is a heterogeneous assemblage. In recent years many new genera have been described from exotic countries, and to keep pace with the present status of genera in the family, I propose to divide our *Brachynemurus* into four groups, which, if they occurred in tropical countries,

would be considered genera, and one of these groups would be divided into two or more genera.

1. Costals with some connecting gradate or cross-veins, labial palpi short; first anal in both wings runs parallel to cubital fork ..... **Brachynemurus**
   Costals simple, or forked toward stigma 2
2. Labial palpi greatly elongated; anal in both wings runs parallel to the cubital fork .....**Scotoleon**
   Labial palpi no longer than maxillary or not much so..... 3
3. In hind wing the first anal runs parallel to cubital fork; more or less evident bent line of veins in wing .....**Hesperoleon**
   In hind wings the first anal bends down to margin on reaching cubital fork; the line of bent veins not plain..**Clathroneuria**

Brachynemurus Hagen.

This genus was described with two species, *B. longicaudus* and *B. nebulosus* (=*ramburi*). Both of these have some of the costals connected by oblique cross-veins. In both wings the first anal runs parallel to the fork of the cubitus for some distance and is connected thereto by several cross-veins. The palpi are short; in the apex of wings the veins are somewhat bent to form the line. In fore wing three cross-veins before origin of the radial sector, in hind wings two before radial sector; the spurs are not, or scarcely, equal to two tarsal joints. There is no comb of bristles on the outer side of coxæ I. Male abdomen very long. *B. tuberculatus* and *B. elongatus* agree with the above characters; also *B. irregularis*.

Type.—*B. longicaudus* Burm.

Hesperoleon n. gen.

Costals simple, or forked toward the stigma; usually three cross-veins before radial sector in fore wing, and two in hind wing; in apex of wings the veins bent more or less to form the line; in both wings the first anal runs parallel to the cubital fork for some distance, and is connected thereto by several cross-veins; spurs rarely more than equal two tarsal joints; coxa I without comb of bristles on outer side; antennæ hardly one-half their diameter apart; labial palpi not elongated.

Type.—*B. ferox* Walk. (*peregrinus* Hagen).

Includes many species, mostly from the West; as *carrizonus*,

brunneus, yavapai, nigrilabris, papago, sackeni, pallidus, singularis, hubbardi, coquilletti, abdominalis, blandus, etc.

Clathroneuria n. gen.

Costal cross-veins simple, or forked toward stigma; in apex of wings the veins are not bent to form the line; in fore wing three cross-veins before radial sector, in hind wing two cross-veins before radial sector; in fore wing the first anal runs parallel to the cubital fork for some distance; but in the hind wing the anal bends down to margin when out as far as the cubital fork, and not connected more than once to the cubital fork. Spurs not as long as two tarsal joints; antennæ not one-half their diameter apart.

Type.—Brachynemurus schwarzi Currie.

Scotoleon n. gen.

Includes also *B. pusillus, barberi,* and *delicatulus.*

In hind wing two cross-veins before origin of the radial sector, in fore wing about four of them. In fore wing the radial sector arises long before the cubital fork; in hind wing about opposite to the fork. In both wings the anal runs parallel to the cubital fork for some distance and connected thereto by several veins; costals simple, except some near stigma are forked. Coxa I without comb of bristles; spurs equal two joints of tarsus. Antennæ nearly their diameter apart; labial palpi very long, the last joint longer than width of the face.

Type.—Brachynemurus longipalpis Hagen.

Revised Keys to the Species of Mosquitoes and Mosquito Larvae found in New Jersey (Dipt.).

By Harry B. Weiss, Assistant to State Entomologist, and Raymond S. Patterson, Assistant to Agric. Exper. Station Entomologist, New Brunswick, N. J.

In 1904, the late Dr. John B. Smith published his admirable report on the mosquitoes occurring within the State, which included a key to the adults and larvae. Since that time, new species have been described and various changes have taken

place in nomenclature and arrangement.

In view of the large amount of extermination work, which is being carried on, and the additional attention which mosquitoes are receiving in New Jersey and other States, it was thought advisable to revise the tables and bring them as near as possible up to date.

TABLE TO DETERMINE THE SPECIES OF ADULT MOSQUITOES.

Series X in which the wings are spotted.

Palpi uniformly dark brown.

Wings with two white spots on the front margin of the wing; last vein wholly white .....*Anopheles punctipennis* Say

Wings with four distinct brown spots; last vein wholly dark brown .....*Anopheles quadrimaculatus* Say

Three small spots, middle of wing; abdomen spotted with brown and yellowish white .....*Aedes discolor* Coq.

Palpi white marked at base of joints; last vein white marked with three black spots .....*Anopheles crucians* Weid.

Palpi black with white tips.

Wings grayish with distinct white spot in middle; thorax black with narrow white lines .....*Aedes signifer* Coq.

Series Y in which the wings are not spotted.

A, in which the feet are white or yellowish-banded.

I. The beak has a more or less distinct white band or ring at or near its middle.

a. The abdomen has a yellowish stripe down its middle, and sides of thorax are white below a black edging, *Aedes sollicitans* Wlk.

b. The abdomen has no yellowish stripe. Sides of thorax are not white.

1. A large blackish species with a narrow white band near the tip of the femur; the tibia white-spotted. *Aedes jamaicensis* Theob.

2. A large brown species with a lighter band near the tip of the posterior tibiae, the latter not spotted. *Coquillettidia perturbans* Wlk.

3. A smaller, blackish species, without markings on femur or tibia.....*Aedes taeniorhynchus* Wied.

II. The beak is without band or ring; uniform in color.

a. The joints of the feet or tarsi are banded or ringed at base only.

1. An extremely large, brownish black species. Legs fringed with erect black scales,
Psorophora ciliata Fabr.
2. A very large species with very scaly wings, the sides of the thorax and bands of abdomen and feet white .....*Aedes sylvicola* Gross.
3. Wings thickly clothed with mixed yellow and brown scales. Thorax with broad, brown central stripe. First tarsal segment of anterior legs not banded,
Aedes fitchii Felt
4. A small dark species with lightly scaled wings; the white bands of the feet narrow; those of the abdomen nearly divided in the centre,
Aedes sylvestris Theob.
5. A small brown species with the hind tarsi wholly white .....*Aedes niveitarsis* Coq.
6. A good-sized brown species, with the bandings yellowish rather than white, those on abdominal segments only a little or not at all notched at the middle; breeds on salt marshes only,
Aedes cantator Coq.
7. Very like the preceding; but the bands of the abdomen and feet are broader and somewhat lighter in color. Breeds only in fresh water areas,
Aedes subcantans Felt
8. Very like the two preceding; but thorax has a central brown stripe .....*Aedes abfitchii* Felt

b. The joints of the hind feet at least are white-banded or ringed at both base and tip; while last joint of hind tarsi is usually entirely white.
1. A good-sized brown species, the thorax without lines or marks, bands of tarsal joints broad,
Aedes canadensis Theob.
2. A small blackish species, with top of thorax covered with gray hair and a dark line down its centre; bands on tarsi are narrow and white,
Aedes atropalpus Coq.
3. A medium-sized species, easily recognized by the peculiar golden streaked appearance of thorax,
Aedes dyari Coq.

c. All of last two tarsal joints and apex of middle joint white.
1. A large or medium sized species, black with deep purple reflections .....*Aedes sayi* D. & K.

B, in which the feet are uniform in color, not in any way marked or banded.

I. The thorax is marked in some way, with stripes or spots, or the sides are white or golden brown.

a. Species with longitudinal white or blue stripes.

1. There are two white longitudinal stripes; the species is of moderate size and blackish,
Aedes trivittatus Coq.

2. There is a well-defined broad central white band, and the top of the head is also white; else as before .....*Aedes serratus* Theob.

3. There is a diffuse white central stripe, not defined as before; a very small blackish species,
Aedes dupreei Coq.

4. There is a central metallic blue stripe; also blue spots. A small dark brown species,
Uranotaenia sapphirina Arrib.

b. Species in which the thorax is yellowish, white or brown, leaving a blackish central stripe or two, usually not sharply defined; all of moderate size.

1. The thorax is yellowish; brownish abdomen with narrow white bands .....*Aedes pretans* Gross.

2. The thorax is golden yellow. Abdomen almost black, with broad white bands....*Aedes abserratus* Felt

3. The thorax is very dark brown with pale yellowish scales at sides; abdomen with dirty white bands,
Aedes inconspicuus Gross.

4. The thorax is dark brown, with two pale yellowish spots on centre. Abdomen dark brown with white bands .....*Culex saxatilis* Gross.

5. The thorax is brown; abdomen not banded, with a metallic silvery gray luster; legs cream-colored,
Aedes pallidohirta Gross.

6. The thorax is golden brown; the abdomen not banded; legs black .....*Aedes aurifer* Coq.

7. The thorax is silvery white at the sides, not extending much on the upper surface, most of which is black; abdomen not banded.
Aedes triseriatus Say

c. Species in which thorax is white-dotted only.

1. There are two small white dots on each side of the middle and a U-shaped white mark at base; the abdomen is banded .....*Culex restuans* Theob.

d. Species in which the entire under surface is silvery white or yellowish.

1. A small form having dorsal surface black; stripes on thorax irregular .....*Wyeomyia smithii* Coq.

II. The thorax is without marks or ornamentation.

a. The segments of abdomen are narrowly banded at their bases.

1. A small dark brown species; abdominal bands wider in middle than at sides except on 7th segment, which usually has a narrow band, broad at sides, *Aedes fuscus* O. S.

2. A moderate-sized brownish species, with the bands of abdomen of moderate width ..*Culex pipiens* Linn.

3. A somewhat darker, longer-legged species, with very narrow regular abdominal bands, *Culex salinarius* Coq.

b. The segments of abdomen are narrowly banded at their apices only.

1. A small, slight, blackish species..*Culex territans* Wlk.

c. The abdomen has no bands or only the merest indications of them.

1. A uniformly dark brown species of moderate size, *Culex melanurus* Coq.

2. Species having thorax yellowish brown, somewhat polished, with a thin bluish gray frosting, *Anopheles barberi* Coq.

TABLE TO DETERMINE THE LARVAE.

Antennae arising from the sides of head not pendant..... 1

1. No siphon or breathing tube on 8th abdominal segment, *Anopheles*.... 2

A siphon or breathing tube on 8th abdominal segment 3

2. Antennae yellowish; tracheal gills moderate in size. *A. punctipennis, A. quadrimaculatus*

Antennae shorter, brownish; tracheal gills short ....*A. crucians*

3. Hair tufts on thorax and abdomen simple, sparse or absent... 4

Thorax and abdomen with star-shaped or stellate hair tufts. *Uranotaenia sapphirina*

4. Abdomen with four tracheal gills at tip 5

Abdomen with two tracheal gills only; a small whitish species with head rounded and thorax subquadrate. *Wyeomyia smithii*

5. Antennae arise from sides of anterior part of head..... 6

Antennae arise from near middle of sides of head; the mouth brushes forming a club at sides of mouth; a very large species ..... *Psorophora ciliata*

6. The scales of the eighth abdominal segment are separate..... 8
The scales of the eighth abdominal segment, 5 to 8 in number, are arranged on a band 7
The scales are replaced by a series of chitinous bars, arranged in a single row 22

7. The anal siphon is very large and stout, dilated centrally; antenna much longer than head, slender with an even outcurve or convexity ..... *Aedes sayi*
The anal siphon, shorter, stout, dilated nearer the base; antenna nearly straight, slender, shorter than head.. *Aedes jamaicensis*
The anal siphon is short, stubby, not dilated; antenna much longer than the head, very thick medially, bisinuate or with an outward and an incurve or convexity..... *Aedes discolor*

8. The scales are not more than 16 in number and form a small patch 9
The scales number 20 or more and form a large patch..... 12

9. Anal siphon of moderate length, three times as long as wide or longer 10
Anal siphon short, less than three times as long as wide..... 11

10. About 12 elongate scales in a single row; 12-16 siphonal spines, each with one moderate-sized tooth, and sometimes a few very small ones below it ..... *Aedes fuscus*
Scales 10-15, in a partly double row, tapering apically; siphonal spines 14-18, simple or with 2 or 3 teeth .... *Aedes sylvestris*
Scales 7-12 in patch; a small translucent species, feeding at bottom; tracheal gills very long and slender..... *Aedes dupreci*
Scales 6-7 arranged in a curve; tracheal gills long, slender, uniformly tapering ..... *Aedes abserratus*

11. A stout black species, the thorax white-banded; antennal tuft composed of many hairs; tracheal gills very long, *Aedes serratus*
An elongate slender gray species; antennal tuft a single bristle; tracheal gills short ..... *Aedes triseriatus*
A large, robust, light species; anal siphon bottle-shaped, outer half linear; anal gills slightly longer than width of ninth segment ..... *Coquillettidia perturbans*

12. Anal siphon short, not much more than twice as long as broad. 13
Anal siphon moderate, from 2½ to 3½ times as long as broad.. 15
Anal siphon long, not less than 4 times as long as broad..... 21

13. Stout compact larva; antennal tuft of several hairs..... 14

Long slender larva, antennal tuft of 1 or 2 hairs; 25-35 scales in patch; 17-21 siphonal spines with 2 or 3 long teeth at base, *Aedes atropalpus*

14. Scales 14-22, with stout apical and slender lateral spines; 13-18 siphonal spines with 2 or 3 small teeth, sometimes simple; fresh water ..... *Aedes trivittatus*

Scales 16-22 with rounded apex and slender lateral spines; 12-16 siphonal spines, with 1-4 small teeth on both sides; head maculate; salt marsh ..... *Aedes taeniorhynchus*

Scales 20-40, with stout apical and slender lateral spines; 16-24 siphonal spines with 1-5 small teeth; head generally immaculate; salt marsh ..... *Aedes sollicitans*

15. Scales rather broad 16

Scales elongate 17

16. Scales 35-40, with 3 stout apical and smaller lateral spines; 16-20 siphonal spines with 1-3 small teeth; head maculate; salt marsh breeder ..... *Aedes cantator*

Scales 25-50, with one very stout apical and slender lateral spine; 16-22 siphonal spines, with 1 or 2 large and 4-6 smaller teeth on basal half; head immaculate; fresh water form, *Aedes subcantans*

17. Only the terminal segment with a dorsal plate or ring..... 18

Last two segments, with dorsal plates; antenna very short, *Aedes signifer*

18. Antenna not specially marked or colored 19

Antenna prominent, white at base, dark at tip.... *Aedes aurifer*

19. Moderate sized species 20

Very large larva; scales 28-34, with long apical and slender lateral spines; siphonal spines 17-22 with 4 or 5 large teeth basally ..... *Aedes sylvicola*

20. Scales 25-30, with short apical and very short lateral spines; siphonal spines 16-20, with 1 or 2 teeth at base, 1 usually very large ..... *Aedes pretans*

Scales 40-45, with 5-7 large apical and smaller lateral spines; 16-22 siphonal spines, with usually 1 or 2, rarely 3 or 4 small teeth ..... *Aedes inconspicuus*

Scales 45 (one larva) with small, slender, apical and fine lateral scales; 15-27 siphonal spines with 1-3 large teeth; rust colored marks on thorax ..... *Aedes niveitarsis*

Scales 25-50, with small apical and smaller lateral spines; 16-24 siphonal spines, with 4-5 serrations on basal half; antenna dark at tip ..... *Aedes canadensis*

21. Antennal tuft above the middle.

Anal siphon of moderate length, sides a little inflated; tracheal gills moderately long .....*Culex pipiens*

Anal siphon very long, rather slender, slightly tapering to tip; head narrower than thorax; tracheal gills short, *Culex salinarius*

Anal siphon very long and slender; a little constricted centrally; head as wide as thorax; tracheal gills moderate or long, *Culex territans*

Anal siphon very long, stout; tapering uniformly. Scales about 80 .....*Aedes dyari*

Antennal tuft below the middle.

Scales 24-30, antenna not arising from an offset..*Aedes abfitchii*

Anal siphon of moderate length, tracheal gills rather long, *Culex restuans*

Anal siphon 5 times as long as widest diameter. Antennae dark at tip .....*Aedes fitchii*

22. A bronzed brown larva, with rather long moderately stout, black, breathing tube .....*Culex melanurus*

A new Hesperid Butterfly from Cuba (Lepid.).

By Henry Skinner.

Ephyriades cubensis n. sp.

Female. Expanse 49 mm. Primaries black (very dark brown) with three small silvery dots at the outer third of the costa, extending into the wing at a right angle from the costa; below these are one or two silvery dots almost obsolete, and in the disc below the end of the discoidal cell are two other silvery spots, much more distinct. Beyond these, toward the margin, the wing is somewhat lighter in color. Secondaries black and very faintly marked with spots or bands (almost obsolete).

Underside. Primaries as above, with the spots repeated, but more distinctly shown. Secondaries smoky black, interspersed with light brown scales or hairs, that show distinctly under a low power lens.

Body and legs black; pectus and palpi white; antennae black with the tips lighter in color below.

Described from one specimen, from Mr. C. T. Ramsden, taken at La Yberia, twenty miles west of Baracoa, Cuba, September 18th, 1909. Altitude 2000 feet.

The genus to which this species is referred may not be the correct one. To be sure of the proper genus it is necessary to have a specimen of the male sex.

Two new Otostigmi from India (Myriop.).

By Ralph V. Chamberlin, University of Pennsylvania, Philadelphia.

The two new species of *Otostigmus* here described may readily be distinguished from the other known species of the genus bearing spines upon the prefemur of the anal legs by means of the following key. In this key only the more closely related forms are actually taken up; but it is constructed so as to eliminate all others.

a. Dorsal plates margined from the 21st segment cephalad at least to the eighth.
  b. The three proximal articles of the antennae glabrous or nearly so.
    c. Ventral plates without true longitudinal sulci; at most with shallow furrows or pit-like depressions.
      d. Last ventral plate with the sides parallel and the caudal margin convexly rounded; ventral plates with eight impressions, *O. cuneiventris* Poc.
      dd. Last ventral plate with sides converging caudad and the caudal margin straight or incurved.
        e. Prefemur of anal legs without a corner spine at distal end above; ventral plates with two median depressions, one caudad of the other .....*O. ceylonicus* Haase
        ee. Prefemur of anal legs with a well developed corner spine; ventral plates with a pair of depressions lying one each side of median line and a small median depression at caudal margin .....*O. simplex* sp. nov.
  bb. Only the 2 1-3 to 2 1-2 proximal articles of the antennae glabrous.
    c. Dorsal plates, excepting at most the first seven, bearing from 7 to 9 longitudinal keels which are serrate or tuberculate.
      d. At most the first 7 pairs of legs with two tarsal spines, the others with 1, or 20th and 21st with none.
        e. Articles of antennae 21; sulci of sternites weak, developed only on anterior 1-3 or 1-2 of plate; 20th legs with no tarsal spine. *O. scaber* Pocock.
        ee. Articles of antennae 17; sulci of sternites strongly developed, crossing the entire plate; 20th legs with a tarsal spine. *O. amballae* sp. nov.
      dd. First 18 pairs of legs with two tarsal spines. Head and first dorsal plate chestnut, with the other dorsal plates bluish green .....*O. insularis* Haase.

Otostigmus amballae sp. nov.

Dorsum brown, olive along middle part of caudal border and in a number of interrupted or broken longitudinal lines or streaks. Head and first dorsal plate somewhat paler than dorsum. Legs testaceous or yellowish; the posterior pairs distinctly ringed with bands of green.

Head shining; showing numerous fine punctae with fewer coarse ones intermixed.

Antennae composed of 17 articles of which the first two are practically glabrous and the third one similarly so at proximal end.

Dorsal plates from the third to the penult inclusive, longitudinally bisulcate, the sulci deep and completely crossing the plates. Plates from about the fifth caudad distinctly margined. All plates excepting the first two and the last one with a low median keel, one each side of this geminated by the sulcus, and two between the sulcus and the lateral margin, these more lateral keels being more or less broken and bearing inconspicuous tubercles along edges; keels most distinct on the caudal segments. First and second plates smooth. All plates punctate. Last plate simply bowed out caudad, the mesal portion of margin rounded, not angular; with a median longitudinal keel extending from the anterior margin caudad a little more than half the length, this keel being followed on the caudal portion of the plate by a conspicuous median furrow; lateral portions of plate smooth or nearly so.

Prosternal teeth 4 + 4; of these the most ectal is much the smallest and the second from mesal line much the largest, the other two being of intermediate size; line of apices of teeth strongly convex; all teeth angular.

Ventral plates from the second to the penult inclusive, deeply longitudinally bisulcate; also with a wider and shallower median longitudinal furrow which is deepest in front of middle. Plates finely punctate and those of caudal half of body tuberculate; the tuberculation becoming more and more conspicuous caudad.

Last ventral plate narrowed caudad, with the sides convex and the caudad margin weakly concave. On caudal half with a distinct median longitudinal furrow which continues cephalad as a pair of finer and less distinct furrows.

Processes of coxopleurae rather long, extending caudad of ventral plate about two-thirds the length of the latter; terminating in four spines or points, and also with a fifth spine on coxopleural margin near caudoectal corner.

At least the first three pairs of legs with two tarsal spines, the others, or all but a few succeeding these, to the twentieth inclusive, with one tarsal spine.

Prefemur of anal legs armed ventrally with an ectal series of 3 spines and a mesal one of 2; in addition with a strictly mesal series of 3 spines increasing in size distad, and along dorsomesal surface a series also of 3 spines, the distal one of the latter being the corner spine at end of joint. Other articles unarmed and smooth.

Length, 38 mm.

Locality.—Amballa, India (Rev. M. M. Carleton coll., 1873). The type is in the Mus. of Comp. Zoology at Cambridge.

Otostigmus simplex sp. nov.

Type specimens at present much bleached from long preservation so that original coloration cannot be definitely ascertained. At present they are brownish, with a pale median longitudinal stripe. Legs yellowish.

Head finely and sub-densely punctate, the punctae being more sparse in the frontal region. A weak median longitudinal furrow midway between sulcus and caudal margin and a more sulciform impression from anterior margin a short distance caudad.

Antennae composed of 18 articles of which the first three are glabrous.

Dorsal plates from the fourth to the penult longitudinally bisulcate. Plates from the 7th or 8th caudad distinctly laterally margined. Finely punctate, but otherwise very smooth, showing no carinae, or at most on some of the caudal plates with a median one obscurely set off by 2 faint longitudinal furrows.

Last dorsal plate with caudal extension sub-triangular, the lateral portions straight or nearly so from corners to median line, the median angle narrowly rounded.

Prosternal teeth 5 + 5; all teeth well rounded and the more mesal ones appearing as mere crenations in the dental plate, the ectal ones better separated and more angular. Process of femuroid of prehensors large; with a single rounded crenulation or tooth on ectal side and two on the mesal.

Ventral plates all finely punctate. Wholly lacking true sulci; but each with a broad longitudinal depression or furrow on each side which does not reach either the anterior or the posterior margin; in addition there is a much smaller median foveola or depression immediately in front of the caudal margin.

Last ventral plate narrowed caudad, the converging sides straight, excepting at ends, where they are convex, caudal margin distinctly incurved. Convex, smooth and without furrows, excepting for a median longitudinal one over the caudal third of length.

Coxopleurae produced beyond the last ventral plate two-thirds to

three-fourths the length of the latter; process terminating in 3 points or spines and with a lateral spine on the ectal margin.

Between 7 and 12 first pairs of legs with the tarsi bearing 2 spines, the others with a single tarsal spine, excepting the penult and anal pairs which have none.

Prefemur of anal legs with a row of 3 strictly ventral spines; along mesoventral edge with a series of 3 spines; and along mesodorsal edge with a third series also of 3 spines, the distal one of the last mentioned being at the corner; the median spine in each series largest. Other joints wholly smooth.

Length, 50 to 55 mm.

Locality.—Not definitely known; but probably India. It is certainly from the Eastern Hemisphere, as shown by the presence of spines on the anal legs. The type specimens are in the Mus. of Comp. Zoology at Cambridge.

Studies Amongst the Coccinellidae, No. 5 (Col.).

A New and Interesting Species.

By F. W. NUNENMACHER, Piedmont, California.

Coccinella bridwelli n. sp.

Color—Shining black throughout, except two small irregular triangular spots on head, anterior angles of pronotum broadly yellow, and the meso-episternum which is whitish yellow. *Form*—Broadly oval. *Head*—Finely and shallowly punctured. *Pronotum*—Finely, closely and more deeply punctured than the head. *Elytra*—Not so closely punctured, but otherwise punctured, the same as the pronotum. *Ventral surface*—A little more coarsely punctured than the elytra.

♂ last ventral segment with large irregular fovea.

Length—♂ 5.50 mm. ♀ 6 mm. *Width*—♂ 4.5 mm. ♀ 4.50 mm.

Type.—♂ ♀ in my collection (and 4 cotypes in Mr. J. C. Bridwell's collection).

Type locality.—Tahquitz valley, San Jacinto Mts., Cal. VII. 17, 1912 (Bridwell).

This pretty species belongs to the *transversoguttata* group on account of its spotted head. I take great pleasure in naming this species for its discoverer, Mr. J. C. Bridwell.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., FEBRUARY, 1913.

The Meetings at Cleveland.

Some twenty-five scientific societies are said to have met in Cleveland in the last days of December and first days of January in conjunction with the Sixty-fourth Meeting of the American Association for the Advancement of Science. To six of these bodies, namely, Section I, Social and Economic Science, of the Association itself, The American Society of Zoologists, The American Association of Economic Entomologists, The Entomological Society of America, The American Association of Official Horticultural Inspectors, and The American Society of Naturalists, papers of an entomological character were contributed, and as the meetings of the six were held in buildings (of Western Reserve University and the Normal School) near together, it was very easy and convenient to pass from one to the other. It was, indeed, necessary at times to choose between two attractive programs, but, even with the loss that this implied, it is a matter for congratulation that the allied interests represented by these associations were, for the greater part of a week, assembled in the same place. Such temporary unions may not always be possible, but it is surely desirable that they should take place whenever facilities equal to those at Cleveland can be had. The two professedly entomological societies met in the Normal School Building, the Economic Entomologists following the Entomological Society

of America, and much of the success of these meetings is due to the kindly aid and supervision of the details, for which we thank our local member, Mr. E. H. Edwards.

Some time must of course elapse before the publication of all the entomological papers read at Cleveland, so we have thought it of interest to our readers to present here a classified list of them with such indications of the addresses of the speakers that workers in the same subjects may know to whom to apply for further information. Abbreviations of the names of the six societies mentioned above denote the body before which each paper was read, either by title or in full.

GENERAL SUBJECTS.—Organization for Effective Work, F. W. RANE, Boston, Mass.; The Arrangement of Material in an Entomological Bulletin, R. L. WEBSTER, Ames, Iowa. (Econ. Ent.) A few experiments in photographing living insects, F. L. WASHBURN, State Entomologist of Minnesota; Notes on insects of a lake beach, HERBERT OSBORN, Ohio State University (Ent. Soc.). Entomological Pioneering in Arizona, A. W. MORRILL, Phoenix, Ariz. (Econ. Ent.). An Entomologist in Costa Rica, Annual Public Address, DR. PHILIP P. CALVERT, University of Pennsylvania. (Ent. Soc.)

GENERAL MORPHOLOGY. — Propharynx and hypopharynx, ALEX. D. MACGILLIVRAY, University of Illinois; Studies on the mouth-parts of *Rhyparobia maderiae* (Blattidae) with a consideration of the homologies existing between the appendages of the Hexapoda, L. B. WALTON, Kenyon College. (Ent. Soc.).

GENERAL PHYSIOLOGY.—Apparatus for Maintenance of Thermal Climatic Conditions, S. J. HUNTER, Lawrence, Kans. (Econ. Ent.). Some facts regarding the influence of temperature and moisture changes on the rate of insect metabolism, T. J. HEADLEE, N. J. Agr. Exp. Station. (Ent. Soc.). Some Results of Studies on Behavior and Starvation of Dermestidae, J. E. WODSEDALEK. (Amer. Soc. Zool.). How Contact Insecticides Kill, G. D. SCHAFER, East Lansing, Mich.; Some Experiments with Roentgen Rays upon the Cigarette Beetle, *Lasioderma serricorne*, A. C. MORGAN and G. A. RUNNER, Clarksville, Tenn. (Econ. Ent.)

REPRODUCTION AND SEX DETERMINATION.—The Offspring of Certain Wing-Mutants X Normal Drosophila and Sexual Dimorphism, F. E. LUTZ, American Museum of Natural History. (Amer. Soc. Zool.). Results of Crossing Two Hemipterous Species with Reference to the Inheritance of an Exclusively Male Character, and its Bearing on Modern Chromosome Theories, K. FOOT AND

E. C. Strobell (Amer. Soc. Natur.) Spermatogenesis in Spiders, T. S. Painter; The Life-Cycle and Sex in Thysanoptera, A. F. Shull, University of Michigan (Amer. Soc. Zool.)

INSECTS INJURIOUS TO PLANTS.—Economic Entomology at the Second International Congress of Entomology, L. O. Howard, Washington, D. C.; New Destructive Insects in New York, P. J. Parrott, Geneva, N. Y.; Results of Experiments in Controlling the Gypsy Moth by removing its favorite food plants, A. F. Burgess and D. M. Rogers, Boston, Mass.; Further Data on Heat as a Means of Controlling Mill Insects, George A. Dean, Lawrence, Kans.; A City's Attempt to Trap Brown-Tail Moths, C. H. Hadley, Jr., Durham, N. H.; The Sugar Cane Insects of Porto Rico, D. L. Van Dine, Rio Piedras, C. R.; Notes on the Rice Water-Weevil, *Lissorhoptrus simplex* Say., and its Control, Wilmon Newell, College Station, Texas; The Sugar Beet Leaf-Hopper, E. D. Ball, Logan, Utah; Some Notes on *Laphygma frugiperda* in Porto Rico, Thomas H. Jones, Rio Piedras, P. R.; Recent Studies on the Weevil and Bud Moth of the Walnut and a Saw fly attacking Blackberry, W. E. Britton, New Haven, Conn.; The Introduction, Methods of Control, and Spread of the Mediterranean Fruit Fly in the Hawaiian Islands, and the Danger of Introducing this Pest into the United States, Henry H. Severin, Madison, Wis. (Econ. Ent., 11 titles). The Disastrous Work of the Mediterranean Fruit Fly and Melon Fly in the Hawaiian Islands, Henry H. Severin. (Amer. Ass. Off. Hort. Insp.). Peach Stop-back, the work of the Tarnished Plant bug, Controlling the Apple Leaf-Hopper in Missouri, and The Unspotted Tentiform Leaf-miner of the Apple, Leonard Haseman, Columbia, Mo.; The Codling Moth and One spraying in the Hudson Valley, E. P. Felt, Albany, N. Y.; Fall Spraying for the Pear Psylla, H. E. Hodgkiss, Geneva, N. Y.; The Success of a Two-Spray Calendar in a Kansas Orchard, H. B. Hungerford, Lawrence, Kans.; Results of the Arsenical Poisoning Investigation, E. D. Ball, E. G. Titus, and J. E. Greaves, Logan, Utah; Notes on comparative tests with Zinc Arsenite and Arsenate of Lead, W. J. Schoene, Geneva, N. Y.; Arsenical Residues on Fruit, W. C. O'Kane, Durham, N. H.; Injuries following the application of Petroleum and Petroleum products to Dormant Trees, E. P. Felt, Albany, N. Y. (Econ. Ent., 10 titles).

INSECTS INJURIOUS TO MAN AND OTHER ANIMALS.—Role of Economic Entomology in the Conservation of Human Life, Dr. L. O. Howard, Entomologist U. S. Department of Agriculture, and Permanent Secretary A. A. A. S. (Section I, A. A. A. S.). Annual address of the President, [Insects Transmitting Disease] W. D. Hunter, U. S. Dept. Agriculture, Washington, D. C. (Econ. Ent.).

Some sources of laboratory material for work on the relation of insects to disease, WILLIAM A. RILEY, Cornell University; Determining the flight of mosquitoes, JAMES ZETEK, Sanitary Commission, Canal Zone. (Ent. Soc.). Mosquito Control Work in Connecticut in 1912, W. E. BRITTON, New Haven, Conn.; Pellagra and the Sand-fly II, S. J. HUNGER, Lawrence, Kans.; The Transmission of Infantile Paralysis by *Stomoxys calcitrans*, a resumé of Observations by Brues & Sheppard and Experimental Work by Rosenau & Brues and Anderson & Frost, C. T. BRUES, Forest Hills, Mass.; The Stable Fly, *Stomoxys calcitrans* L., its Bionomics and Life History, C. GORDON HEWITT, Ottawa, Can.; The Stable Fly, *Stomoxys calcitrans* L., an important Live Stock pest, F. C. BISHOPP, Dallas, Texas. (Econ. Ent., 5 titles). Some anatomical studies of *Stomoxys calcitrans* Linn., C. K. BRAIN, Ohio State University. (Ent. Soc.). A Campaign Against Flies, JEAN DAWSON, Cleveland, Ohio. (Section I., A. A. A. S.). Some external parasites of domestic fowls, G. W. HERRICK, Ithaca, N. Y.; Notes on little known habits of the spotted fever tick, R. A. COOLEY, Bozeman, Mont.; Additional Notes on the Biology of the Rocky Mountain Spotted Fever Tick (*Dermacentor venustus* Banks), F. C. BISHOPP and W. V. KING, Dallas, Texas. (Econ. Ent.).

BENEFICIAL INSECTS. — Some natural Enemies of Red Spiders, H. J. QUAYLE, Berkeley, Calif.; Preliminary Review of the Parasites of *Coccus hesperidum* in Calif., P. H. TIMBERLAKE, Whittier, Cal. (Econ. Ent.).

SPECIAL GROUPS. ARACHNIDA.—The Origin of Arachnida in the Light of Palaeontological Evidence, ALEXANDER PETRUNKEVITCH, Yale University (Amer. Soc. Zool.).

THYSANURA.—Notes on the Distribution of *Thermobia domestica* and *Lepisma saccharina*, S. R. WILLIAMS, Miami University (Amer. Soc. Zool.).

ORTHOPTERA.—Notes on Three Common Tree Crickets, P. J. PARROTT and B. B. FULTON, Geneva, N. Y.

PLECOPTERA.—Mating and egg-laying habits of *Perla immarginata* Say., LUCY WRIGHT SMITH, Mount Holyoke College. (Ent. Soc.).

EPHEMERIDA.—Eggs and egg-laying of may-flies, ANNA H. MORGAN, Mount Holyoke College. (Ent. Soc.).

HEMIPTERA.—Remarks on the Cicadidae with special reference to the Ohio species, PROF. HERBERT OSBORN, Ohio State University; A study in antennal variation, EDITH M. PATCH and WILLIAM C. WOODS, Maine Agr. Exp. Station. (Ent. Soc.). *Schizoneura ulmi* (*fodiens*) distinguished from *Schizoneura lanigera* (*americana*), EDITH M. PATCH, Orono, Maine. (Econ. Ent.). Life cycle and de-

velopment of the Tarnished Plant-bug, *Lygus pratensis* Linn, LEONARD HASEMAN, University of Missouri; The strigil in Corixidae and its probable function, J. F. ABBOTT, Washington University. (Ent. Soc.).

THYSANOPTERA.—Head and mouth-parts of *Cephalothrips yuccae*, ALVAH PETERSON, University of Illinois. (Ent. Soc.).

COLEOPTERA.—The ontogeny of elytral pigmentation in *Cicindela*, VICTOR E. SHELFORD, University of Chicago; Life history and habits of *Trogoderma tarsale*, a museum pest, J. E. WODSEDALEK, University of Wisconsin. (Ent. Soc.).

TRICHOPTERA.—An interesting feature in the venation of *Helicopsyche*, the Mollannidae, and the Leptoceridae, C. BETTEN, Lake Forest University. (Ent. Soc.).

LEPIDOPTERA.—The homology of the body setae of lepidopterous larvae, Y. H. TSOU and S. B. FRACKER, University of Illinois; The anatomy of some lepidopterous pupae, EDNA MOSHER, University of Illinois; The tracheation of the pupal wings of some saturnians, N. L. PARTRIDGE, University of Illinois. (Ent. Soc.).

DIPTERA.—On the biology of *Drosophila ampelophila*, FRANK LUTZ, Amer. Mus. Nat. Hist.; Observations on the biology of a blow-fly and a flesh fly, E. P. FELT, State Entomologist, New York. (Ent. Soc.).

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Eleodes in Minnesota (Coleop.)

During the months of July and August, 1911, while collecting on the low sand hills west of Fergus Falls, Minnesota, I had the good fortune to secure several specimens of *Eleodes tricostata* Say. The beetles were found under boards along the Union Pacific Railway tracks and were quite common. This species I also collected in the latter part of August at Wall Lake, Minnesota, about six miles east of Fergus Falls. Here, also, the region is sandy but the beetles were not so common as at Fergus Falls. This is, I believe, the first record of the occurrence of *Eleodes* in the State.

Blaisdell, in his "Revision of the Eleodiini of the United States" (Bull. 63, U. S. N. M., 1909), says of the sub-genus *Melaneleodes* Blaisdell: "Distributed throughout nineteen States out of the twenty-three west of the Mississippi River. I have no record of specimens from Missouri, Arkansas, Minnesota and Louisiana."

Professor H. F. Wickham (List of the Coleoptera of Iowa, 1909), gives the following Iowa records: *Eleodes suturalis* Say, "Lyon County." *Eleodes tricostata* Say, "Elma, Ames, Independence; and Lyon, Dickinson, Emmet and Woodbury Counties." The Dickinson County records are based on specimens taken in the vicinity of Lake Okoboji, by B. Shimek, O. W. Rosewall and A. O. Thomas. In this locality the species seems quite abundant.—DAYTON STONER, State University of Iowa, Iowa City, Iowa.

Andrena dunningi Ckll. (Hymen.)

Since this species was described from Connecticut in 1898, a good deal of confusion has arisen concerning it. In ENTOM. NEWS, July, 1907, p. 286, Viereck writes *A. nivalis* Sm., with synonyms *pruni, dunningi, viciniformis, convexa* and *viburnella*. However, in the separate he kindly sent to me, he has in a manuscript emendation removed *pruni, dunningi* and *viburnella* from the synonymy of *nivalis*, making *viburnella* a sub-species of *A. perplexa*, and *pruni* a distinct species with synonym *dunningi*. It is certain that *dunningi* is not *nivalis* (the type of which I have seen); they not only differ in their characters, but Dr. Graenicher finds their time of flight is different. The characters of *dunningi* are not those of *pruni*, but the description of *viciniformis* agrees with *dunningi*. I have just received a post card from Mr. Charles Robertson in which he states that his *viciniformis* is identical with *dunningi;* the latter has two years' priority. The insect is well distinguished from *A. pruni* in both sexes, as shown in Robertson's tables, Trans. Amer. Ent. Soc., XXVIII, pp. 190-192.— T. D. A. COCKERELL.

Notes on Lycaena neurona (Lepid.).

This species was described from the female sex, in ENTOMOLOGICAL NEWS, vol. 13, p. 15, 1902. I had at that time five specimens that I took to represent both sexes, but I did not dissect out the genitalia to be sure. They came from Doble, California, which place Mr. W. G Wright in his "Butterflies of the West Coast" describes as follows:— "It is a high mountain valley 6,500 feet in altitude, the northern and eastern sides being bordered by the Mojave Desert. But few forms of butterfly life are present there, but the few which do occur may well be variations of one kind or another. The locality Doble, is at the upper end of Bear Valley, in San Bernardino County, California; the grassy valley is surrounded with pine-clad mountains."

I have recently had a letter from Mr. H. H. Newcomb, of Venice, California, in relation to this species. He took ten males and seven females, last August, at the top of Mt. Wilson, Los Angeles County, Cal., on a little patch of ground one hundred by three hundred feet.

He also says that *Lycaena acmon* of both sexes was flying at the same time, not only at this locality but everywhere else. It seems that the Californian Lepidopterists, including Mr. Wright have taken *neurona* to be merely a variety of *acmon* female. Mr. Newcomb did not share this opinion and sent me a male specimen for examination. In the original lot from Doble there are three males and two females and I also have a female from Pine Mountain Forest Reserve, Ventura County, California. *Acmon* with which the species has been confused, has sexes unlike (antigenetic), while in *neurona* there are no secondary sexual characters. It is a smaller species than *acmon* and may be known by the orange colored neuration which is relatively variable in different specimens.—HENRY SKINNER.

Birds & Butterflies (Lepid.)

During the rainy season in South Africa, the open glades in the forests bordering the rivers are gay with multitudes of brightly colored butterflies of many different species and after a night's rain butterflies of various kinds may often be seen settling in masses around pools of water along wagon roads. Most of these are conspicuously colored, though they are in perfect harmony with the sunlit flowers which spring up at the time of year when they appear. I cannot, however, believe that the need for protection against birds or other enemies has anything to do with the determination of their various colors, as in all my experience (and I have all my life been a close observer of nature) I have never once seen a bird feeding upon butterflies in Africa.—*African Nature Notes and Reminiscences,* by FREDERICK COURTENEY SELOUS, F. Z. S.

Insect Arrow Poison (Coleop.)

Bushmen in Africa. Their bows are very small and weak looking and their arrows are unfeathered, being of light reeds into the ends of which bone heads are inserted. These bone arrow heads are always thickly smeared with poison, which seems to be made from the body of a grub* or caterpillar mixed with gum. At least, in the bark quivers of the Bushmen whose belongings I have examined, I have usually found, besides their arrows and fire sticks, a small bark cylinder closed at one end, in which were the bodies of grubs or caterpillars preserved in gum, which I was told contained the poison they smeared on their arrows.—*Ibid.* SELOUS.

*Perhaps the larva of the Chrysomelid *Diamphidia locusta;* see Wellman, ENT. NEWS, XIX, p. 229, also v. Fürth, Vergl. chem. Physiol. d. niederen Tiere, 1903, p. 365.—ED.

Trichoptera Collected Under Unusual Conditions.

On November 30, 1912, I started at an early hour with two friends for a long "hike" in the mountains near Salt Lake City. At nine o'clock A. M., when we had reached a point several miles up a nearby canyon and were well up on the mountain side, we were forced to turn back by a snowstorm. By the time we had reached the bottom of the canyon and the road which led along the stream, the ground was well covered with fresh snow. As there had been snow and cold weather for some weeks at that altitude (estimated at 6000 ft.) I was not engaged in looking for imagos of Trichoptera, and was much surprised to discover a live one crawling on the snow. It was bottled as a record specimen for late transformation, but another and another was found as we walked along the road until, in a short time, twelve individuals were picked up. As it was still snowing heavily and bade fair to continue all day I decided not to stop to collect more, but to count those seen in passing. A total of thirty-three individuals was thus recorded. All were fresh, as if just emerged, and all were of a single species, *Platyphylax designatus* Walk. I have previously taken single specimens at irregular times, but none so late as this. The majority of the imagos emerge in May and June in Wisconsin, but the time is less regular in the mountain regions, where they emerge at later and later dates as the altitude is greater, Emergence of numbers at so late a date at any altitude in this climate is to me inexplicable. On arrival at the laboratory it was discovered that but nine of the individuals were in the bottle, wet gloves and chilled fingers having doubtless been responsible for some loss while collecting. These nine specimens are all of one sex, all being females.—Chas. T. Vorhies, University of Utah, Salt Lake City, Utah.

The 1912 Swarm of Aletia argillacea (Lepid.).

It may be of some interest to have recorded that our annual visit of swarms of *Aletia* (*Alabama*) *argillacea* was not omitted the present season.

During the week ending October 12, the moth was marvelously conspicuous in this neighborhood. Thursday, October 10, I was riding in a trolley car on a North and South line and there were literally hundreds of *argillacea* on the windows on the West side of the car, while but few were to be seen on its East side. This would seem to indicate that the flight was from the West. The fact that all specimens were in excellent condition, as if they had just emerged, makes one reluctant to believe that their flight could possibly have been all the way from the cotton fields.

They were more or less abundant in this vicinity for several days afterwards. I took them both at a light-trap and at sugar. Many

specimens were reported or brought to me for identification from various parts of the county indicating an abundant distribution over many miles of area. Is there a local food plant?—O. S. Westcott, Oak Park, Illinois, Nov. 6, 1912.

The Occurrence of Leucania unipunctata (Haworth) on Sugar Cane in North Queensland (Lepid.).

The characteristic caterpillars of this species were observed damaging young cane and corn plants at Nelson, North Queensland, in June, 1912. The larvæ were in only a few cane and corn fields where they caused considerable damage. The young leaves of both cane and corn were eaten off near the base, but the other leaves were also eaten. During the day the larvae remained concealed in the crevices of the leaves, but in dull cloudy weather a few were observed feeding. It was noticed that whereas both young and old corn plants were attacked, only cane plants under three feet high were damaged. Parasitic wasps in large numbers were seen in the infested fields. In one small corn field in the township of Nelson, the larvæ stripped almost every leaf from the plants and the whole field was practically ruined. This was an isolated case.

On June 24, 1912, twenty-three larvæ were taken from a corn field and placed in jars with cane leaves and a little earth. They had pupated by June 30. The moths commenced to emerge on July 10 and continued to emerge until July 23, fifteen of the twenty-three reaching maturity. The remaining pupae were kept for three weeks longer but nothing came from them.

On June 28, twenty-two large larvæ were taken from a cane field and were kept in the same manner. They had pupated by July 3. The adults began to emerge on July 15 and continued up to July 23 Of the twenty-two larvæ taken, twelve reached maturity. No insects emerged from the remaining ten.

The average daily temperature from June 24 to July 23 was 21.16 deg. C. (70.1 deg. Fahr.).—Alan P. Dodd, Entomological Laboratory, Sugar Experiment Stations, Mackay, Q.

Eustypiura rodriguezi (Hym.)

When publishing this Guatemalan Chalcidid recently in the News, I knew only that it had been bred from a lepidopterous insect. Mr. Juan Rodriguez now sends me an account of the host, sufficient to show that it is a Psychid, probably a species of *Oiketicus*. It may well be that the remarkable abdomen of *Eustypiura* is for the purpose of reaching Psychid larvæ in their cases, and that the members of the genus will be found to be all parasitic on Psychidæ.—T. D. A. Cockerell.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

6—Journal, New York Entomological Society. **7**—U. S. Department of Agriculture, Bureau of Entomology. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **18**—Ottawa Naturalist. **21**—The Entomologist's Record, London. **22**—Zoologischer Anzeiger, Leipzig. **24**—Berliner Entomologische Zeitschrift. **40**—Societas Entomologica Zurich. **47**—The Zoologist, London. **50**—Proceedings, U. S. National Museum. **55**—Le Naturaliste, Paris. **60**—Anales, Museo Nacional de Buenos Aires. **64**—Annalen, K. k. Naturhistorischen Hofmuseums. Wien. **79**—La Nature, Paris. **84**—Entomologische Rundschau. **86**—Annales, Societe Entomologique de France, Paris. **89**—Zoologische Jahrbucher, Jena. **97**—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. **166**—Internationale Entomologische Zeitschrift, Guben. **172**—The American Museum Journal, New York. **175**—Aus der Natur, Berlin. **180**—Annals, Entomological Society of America. **184**—Journal of Experimental Zoology, Philadelphia. **186**—Journal of Economic Biology, London. **187**—Jahrbucher des Nassauischen Vereins fur Naturkunde, Wiesbaden **189**—Pomona Journal of Entomology, Claremont, Cala. **191**—Natur, Munchen. **195**—Bulletin, Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **201**—Memoires Societe Entomologique de Belgique. **216**—Entomologische Zeitschrift, Frankfurt a. M. **246**—Bulletin International, Academie des Science de Cracovie. Ser. B. Sciences Naturelles. **251**—Annales Sciences Naturelles, Zoologie, Paris. **269**—Memoirs, Department of Agriculture in India. Entomological Series. Calcutta. **274**—Archiv fur Zellforschung, herausgeben von Dr. R. Goldschmidt Leipzig. **306**—Journal, College of Agriculture, Imperial University of Tokyo. **311**—La Science au XXe Siecle, Paris. **322**—Journal of

Morphology, Philadelphia. **327**—Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India (new ser.), Calcutta. **346**—Fauna Exotica. Mitteilungen aus dem Gebiete der exotischen Insektenwelt, Frankfurt am Main. **355**—Smithsonian Institution Report, Washington, D. C. **368**—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. **381**—Experiment Station Record, Washington, D. C. **397**—Pfluger's Archiv fur die Gesammte Physiologie des Menschen und der Tiere. Bonn. **409**—Journal of the Academy of Natural Sciences of Philadelphia, 2nd Series. **410**—Journal of the Washington Academy of Sciences. **411**—Bulletin of the Brooklyn Entomological Society. **412**—Porto Rico Agricultural Experiment Station, Mayaguez. **413**—Report of the State Entomologist of Minnesota, St. Anthony Park.

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REVIEW.

TROMBIDIIDAE, By A. BERLESE. Redia, Vol. VIII, fasc. 1°. June 29, 1912.—This monograph of the so-called "harvest mites" consists of 291 pages, and contains 137 text figures and one colored plate. The numerous genera into which this family has recently been divided are here for the first time clearly defined. The author gives in a few semidiagramatic figures the principal characters of the different genera. He also follows the excellent practice of tabulating all the important generic characters, and grouping, by means of keys, the different genera into separate tables according to the variations of a single character. By such an analysis the range of structural variations is made clear, and the correlation of these variations is made possible. Thus the natural affinities of the genera being exposed, their natural arrangement follows with ease. Besides, this method enables one frequently to place poorly preserved or mutilated specimens with facility and certainty when it would be impossible to do so by means of a single complicated key which should require the ascertaining of many, if not all, of the generic characters considered.

At the end of the work the various species are arranged into tables according to the countries in which they are found. Also a synonymical table and bibliography are given.

It is unfortunate that some of the common species found in this country are omitted in this work.—H. E. EWING.

OBITUARY.

W. G. Wright.

William Greenwood Wright died at his home on F. Street, in San Bernardino, Calif., on Sunday afternoon, December 1, 1912, at the age of about 83. He had been in apparently good health and spirits for some time past. He was found dead sitting in his chair, a newspaper fallen from his relaxed grasp. The cause was heart failure, and his death must have been an instantaneous and painless one.

He was born near Newark, New Jersey, the exact date not ascertainable; his early education was limited. He was a soldier in the Union Army during the Civil War, and soon after the close of that conflict he must have come to California; where he resided a few years in Los Angeles, and where his only child was born and died in infancy. He went to San Bernardino about 1873, and conducted a planing-mill for many years. About fifteen years ago he retired from business, and spent his time in collecting and gathering material for his book on butterflies. His wife died a number of years ago and he leaves no near relatives. His collection of butterflies and library he has left to the California Academy of Sciences in San Francisco; some other collections are to be sold. Mr. S. B. Parish, the pioneer botanist, a close friend of Mr. Wright and the executor of his estate, has given me the few data pertaining to his life that are now obtainable; he was a recluse in all phases of his life, and the most we have is that indefinable quality which only personal acquaintance can give; and his writings and contributions to science.

Mr. Wright traveled all over the West Coast from Alaska to Mazatlan, Mexico, collecting specimens in various departments of natural history, but we do not, at present, know the details of his trips. He published an interesting account of his travels in Mexico, in *Zoe,* a biological journal printed in San Francisco from 1890-1893; an article in the *Overland Monthly* for 1884, entitled, "A Naturalist in the Desert," and an article on collecting in Alaska, which I cannot now locate. Other papers are found in *Entomologica Americana, Canadian Entomologist,*

Papilio, Entomological News, and Edwards' *Butterflies of North America;* I think the most important contribution which he made to science was the help he rendered to W. H. Edwards, in his great work just mentioned. In the *Ornithologist and Oologist,* for February, 1885, we find an article entitled, "An Experiment in Bird Taming, with *Phainopepla nitens*"; his name is frequent in the two large volumes of the Geological Survey, Botany of California, as he was an enthusiastic botanical collector. In fact he was a naturalist in the strict sense; they are becoming rarer every day. His book, *Butterflies of the West Coast,* published in San Francisco in October, 1905, was really an epoch-making publication, notwithstanding the numerous inevitable mistakes. The fire and earthquake of April 18, 1906, destroyed the publishing house, and the book is now quite rare.

Wright was a close friend of the two pioneer naturalists, Edward Palmer and C. C. Parry, and made many trips with them. He was acquainted with many more, if not most, of the early naturalists, but the data are not now obtainable.

The following butterflies and moths have been named in his honor by different entomologists: *Melitaea wrightii, Copaeodes wrightii, Scepsis wrightii, Gluphisia wrightii, Leptarctia wrightii* and *Selidosema wrightiarium.* Wright named many species, but most of them, especially those in his 1905 book, are synonyms.

W. G. Wright has played his part, doubtless as well as he knew; he has added something to science, and has helped others in their researches, which is as much as any one can do. The following quotation from his book expresses the spirit of all scientific work: "The most that we can do is to note down the things as we find them, and an aggregation of these notes after a series of years will afford a distinct step forward in the investigation."—Fordyce Grinnell, Jr., Pasadena, Cal.

I visited him several years ago, an account of which I published in the pages of this magazine, Volume XXII, pages 11-13. He was a kindly man, and was known and loved by all the children of San Bernardino.—Karl R. Coolidge.

William Forsell Kirby.

(Portrait, Pl. IV*)

From *The Entomologist,* of London, for December, 1912, we learn that this diligent and laborious entomologist died on the 20th of November last. He was born in 1844, the son of Samuel Kirby, banker, of Leicester, and after twelve years in the Museum of the Royal Dublin Society, came to the Zoological department of the British Museum of Natural History in 1879, where he remained for thirty years, until his retirement, in 1909.

He published on many groups of insects, the Lepidoptera being perhaps his favorite order. One of his early works was a *Manual of European Butterflies* (1862), while he was a collaborator on Seitz's *Macrolepidoptera of the World,* now publishing and recently reviewed in these columns.

The students of the Lepidoptera owe a large debt of gratitude to Mr. Kirby for the production of two works of very great value. *A Synonymic Catalogue of Diurnal Lepidoptera,* published in 1871, with a Supplement in 1877, did much to advance the study of these insects. It was invaluable both to the collector and the systematist, and very frequently consulted by both. Even though other catalogues appear, Kirby's will probably always be of use. In the same category is his *Catalogue of Lepidoptera Heterocera: I. Sphinges and Bombyces.* This work of 951 pages was published in 1892 and was twenty years in preparation. Accurate and up-to-date catalogues are essential to study and some branches of entomology are greatly retarded by the lack of such works. He wrote *A Hand-book of the Order Lepidoptera* (1894-1897), and, in conjunction with H. G. Smith, *Rhopalocera Exotica* in three volumes (1887-1902). This latter is a beautifully illustrated work, in color, and contains descriptions of many species. He

*Our portrait is taken from a photograph sent by Mr. Kirby about 1896. In a letter of June 6, 1906, he mentions that "Thomas Wright has just given a portrait of me in his new life of Sir Richard Burton, with a notice, in which, however, there are several misprints." Another portrait has appeared in the *Entomologist* for January, 1913.

also wrote the text of an English Edition of Huebner's *Exotic Butterflies,* which was edited by P. Wytsman, in three volumes, and 491 colored plates (1894-1908). H. S.

Mr. Kirby's Orthopterological work was entirely a matter of the last twenty years. In addition to several papers bearing on the classification of the Forficulidae, Blattidae and Phasmidae, a number of faunistic papers, chiefly treating of African localities and one on the status of generic names in the order proposed previous to 1840, appeared from his pen. The monumental work which made his name a very familiar one to the Orthopterist was the compilation and publication of his *Synonymic Catalogue of Orthoptera* (1904-1910). This indispensable work comprises three volumes and is the only general catalogue of the Orthoptera ever published. While containing a great number of clerical errors, this piece of work stands as one of the most important contributions to the systematics of the order.

J. A. G. R.

His earliest paper on the Neuroptera (Odonata) was published in his fifteenth year (1859), but although he dealt with the collections made by the *Challenger* (1884) and others, his important work on this group was not until 1889, when his *Revision of the Subfamily Libellulinae* appeared in the Transactions of the Zoological Society of London. Of this the most recent and most thorough-going student of our time, Dr. F. Ris, has written:*

> Previously, with other authors, I was disposed to extend sharp criticism to this work on account of some very evident errors. On deeper personal acquaintance with the subject, this criticism has given way to a sincere recognition of Kirby's keen sense of the generically important characters and happy formulation of many criteria previously completely overlooked. The defects of the work are those of a pioneer in a field which had lain too long fallow. To-day I have found it right and practical to characterize the genera in the

*Collections Zoologiques du Baron Edm. de Selys Longchamps, Catalogue Systematique et Descriptif. Fasc. IX. Libellulinen, p. 11. 1909.

Libellulinae essentially in the sense understood by Kirby. If a number of his genera have been suppressed, this is due in the majority of cases to the discovery of new material connecting apparently separate groups.

In 1890, Mr. Kirby published, at his own expense, his *Synonymic Catalogue of Neuroptera Odonata, or Dragonflies. With an Appendix of Fossil Species.* This is the least of his catalogues in point of size, but has been greeted with hearty recognition of its usefulness by de Selys, Ris and others, in spite of certain far-reaching nomenclatural changes which have not yet gained general acceptance. His other papers on the Odonata are briefer and faunistic in character.

Mr. Kirby was very willing to help visitors and correspondents who desired information on the insects in the British Museum, or on bibliographical and nomenclatural subjects, as not a few of the readers of the NEWS can testify. Lying before the writer are twelve letters from him, from February 14, 1890, to January 13, 1909, chiefly replies to inquiries on one or other of these topics. One of these letters (April 25, 1899) refers to criticism of his work in these words:

> In many ways my Entomological work has been that of a pioneer, and I cannot complain of younger men taking it up and following it out in greater detail than I have had time or inclination to do. I never complain of *fair* criticism; but such attacks as ——— and ——— have made upon me I do not regard in that light. If I chose, I could often retaliate on ——— in the same way, but I usually confine myself to corrections when they fall into line with my own work, and I seldom go out of my way to reply to attacks unless they are too unfair. But you need never be afraid of offending me by fair comment.

Another letter (September 24, 1904) is of interest in giving his own estimate of his work:

> My entomological work has always been rather bibliographical than practical; getting existing material into such order that others can take them up and work them out in detail. Hence it is easy for younger men to outstrip me in practical entomological work; and for minute details I never had any particular taste.

In January, 1909, he wrote:

> I am just retiring from the Museum under the age limit but shall

continue to work on semi-officially or unofficially for some little time probably, and it is not impossible that I may later on undertake a new Catalogue of Odonata for the Museum.

He continued to visit and work at intervals at the Museum until August or later of the past year (1912).

In May, 1899, he paid a three weeks' visit to his brother in Boston, Massachusetts, but did not travel much in the country.

His literary labors resulted also in many popular books on entomology, in writings on folk-lore and ethnology, and in at least one volume on *Evolution and Natural Theology*.

Mr. Kirby's wife died some years ago; he is survived by a son.

[Since the above was written the January number of the *Entomologist's Monthly Magazine* has reached us with an obituary notice of Mr. Kirby, containing a number of additional interesting details.]

P. P. C.

Peter Cameron.

Two obituary notices, of very different character, of this voluminous writer on Hymenoptera have appeared in the January issues of the *Entomologist's Monthly Magazine* and of the *Entomologist* respectively. From them we learn that he died at New Mills, Derbyshire, England, December 1, 1912, aged sixty-five. His earlier years were much handicapped by poverty and ill health. Throughout his life he was known to very few of his fellow entomologists. His principal works were a *Monograph of the British Phytophagous Hymenoptera* in four volumes published by the Ray Society, 1882-1892, and volumes I and II of the Hymenoptera of the *Biologia Centrali-Americana*, 1883-1900. His collection of British Phytophagous Hymenoptera and a large number of his exotic types are in the British Museum of Natural History, others forming part of the Rothney collection of Indian Hymenoptera are in the University Museum, Oxford.

Correction.

News for January, 1913, page 3, line 8, the date of birth of Raphaelle Peale should be 1774, instead of 1744.

WILLIAM FORSELL KIRBY.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Rare Saturnidae and Parnassiinae as *Act. selene*, *Callandra* (new), *Sat. pyretorum*, *pearsoni* (new), *Hemileuca burnsi* (new), and 60 other species to exchange for American Saturnids and Parnassids, *Calleta* and *eversmanni*.—J. Henry Watson, 70 Ashford Road, Withington, Manchester, England.

For Exchange—Have for exchange Cicindelidae in sets; also other Coleoptera for Cicindelidae and Cychrus not in my collection.—Adolph Mares, 2517 Homan Ave., Chicago, Ill.

Chrysochus cobaltinus Lec. for exchange.—R. J. Smith, Milpitas, Santa Clara, Co., Cal.

Wanted for exchange—Coleoptera for native or exotic specimens—Cicindelidae, Carabus, Cychrus, Calosoma, Lucanidae, etc. List on application.—Frank Psota, 1142 S. Whipple St., Chicago, Ill.

Dynastes hercules beetles direct from the original collector. Two new localities, namely St. Lucia and British Guiana, also from Dominica; for sale or exchange.—A. F. Porter, Decorah, Iowa.

Wanted—Living pupae of Saturnid moths. State quantity and price. Phil. Rau, 4932 Botanical Ave., St. Louis, Mo.

Change of Address—F. H. Wolley Dod, Millarville, Alta, to Midnapore, Alta.

For Exchange—*Cychrus andrewsii* and *Cychrus ridingsii* with full data.—T. N. Brown, 71 Highland Ave., Uniontown, Pa.

Wanted for Cash or good exchange, all American live pupae and cocoons, and 100 or more North American Parnassius in paper not expanded. Give nice exotic Lepidoptera and nice large Coleoptera.—Communicate with Monsieur Frank Sever, 333 E. 49th St., N. Y. City.

Lepidoptera—Specimens of diurnals from this section in exchange for other N. A. species new to my collection.—R. A. Leussler, 1137 S. 31st St., Omaha, Neb.

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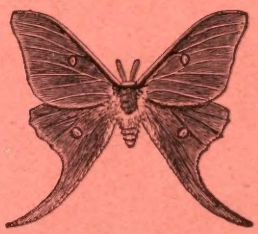

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